

Remarks

Reconsideration is requested in view of the following remarks. No claims are amended but new claims 23-24 are presented for consideration. Upon entry of this Amendment, claims 1-5, 7-12, 14, and 19-24 are pending. Claims 1 and 9 are independent.

Support for new claims 23-24 can be found in the application at, for example, pages 19-20. No new matter is introduced.

Claim rejections under 35 U.S.C. §103 in View of Brown and Odom

Claims 1, 2, 9-12, and 19 are rejected as obvious from a combination of Brown et al., U.S. Patent 5,557,686 (hereinafter Brown) and Odom, U.S. Patent 7,350,078 (hereinafter Odom). This rejection is traversed.

Neither Brown nor Odom teaches or suggests at least “a data interception unit for receiving inputs from a user, wherein the data interception unit is configured to passively collect mouse data generated in response to the user” as recited in claim 1.

In contrast to claim 1, both Brown and Odom teach actively receiving data that is generated in response to predetermined keystroke sequences or predetermined mouse gestures. For example, according to Brown, user access is provided as follows:

30 sample is from an authorized user. Last, when a user desires access to the system, the user types the previously determined keystroke sequence which is constructed into a vector and fed into the trained neural network. Note that alternative

See Brown, col. 2, lines 29-32. Thus, Brown merely teaches that authorization is based on the user duplicating a previously entered keystroke sequence.

Odom fails to cure the deficiencies of Brown. According to Odom, data submissions by a user can be passively terminated when sufficient data is received so that an authentication decision can be made. But these passively terminated data submissions are user attempts to duplicate previous actions chosen by the user or presented to the user for use as an authentication key:

10 Historically, validation 18 has required an absolute signal
match 5 to input 22: for example, no deviance from a
character-based password has been permitted. With mouse
107 movements, or other difficult-to-exactly-replicate sig-
nals 2, however, some tolerance may be permitted. Signal 22
15 tolerance should be allowed when appropriate, and may be
set by software-determined protocol or user selection. For
example, deviance up to 10% from recorded signal match 5
for keystroke timing 211 may be acceptable. Similarly, as
another example, mouse click location may vary within a
20 radius of 10 pixels and still be tolerated. As multiple signals
2 may comprise a submission 9, the need for exactness for
any single signal 2 to properly authenticate access 97 is
lessened.

See Odom, col. 4, lines 10-23. Thus, according to Odom, user authentication is based on specific predetermined mouse gestures which a user attempts to duplicate. In contrast, according to claim 1, mouse data is collected passively, that is, without instruction or prompt by the computing system and without the user being called upon to perform any particular actions or sets of actions. Thus, both Brown and Odom describe methods for user authentication based on user duplication of predetermined sets of actions. In both Brown and Odom, the user is expected to provide the same predetermined data to be granted access. According to claim 1, verification is based on how the user performs *any* series of actions, that is, based on passive data collection. For at least this reason, claim 1 and its dependent claims are properly allowable.

Independent claim 9 recites, in part, “passively collecting behavioral biometric information from the mouse.” Neither Brown nor Odom teaches or suggests such passive information collection. Brown merely discloses using predetermined keystroke sequences. Odom fails to cure the deficiencies of Brown. Odom describes specific sequences which must be duplicated, or at least approximately duplicated, by a user for authentication. In contrast, claim 9 recites “passively collecting behavioral biometric information,” i.e., collecting user data without any prompts or predetermined mouse sequences. Because Brown and Odom fail to disclose all the features of claim 9, claim 9 and its dependent claims are properly allowable.

Claim rejections under 35 U.S.C. §103 in View of Brown, Odom, and Boebert or Akiyama

Claim 3 is rejected as obvious from a combination of Brown, Odom, and Boebert et al., U.S. Patent 5,967,718 (hereinafter "Boebert"). Claims 4-5, 7-8, 14, and 20-22 are rejected as obvious from a combination of Brown, Odom, and Akiyama, U.S. Patent 5,768,387 (hereinafter "Akiyama"). These rejections are traversed. Claims 3-5, 7-8, 14, and 20-22 depend from allowable claims 1 and 9 and are allowable for at least this reason. Applicants note that, according to Akiyama, mouse movements are detected in response to presentation of a menu screen. Akiyama, col. 11, lines 42-47 and Figs. 8-10. Thus, Akiyama discloses actively collecting mouse movement data, and Akiyama does not disclose or suggest passive data collection as claimed. For this reason, Akiyama fails to cure the deficiencies of Brown and Odom and all pending claims are patentable over any combination of these references. In addition, dependent claims 3-5, 7-8, 14, and 20-22 recite additional features and combinations of features that are novel and non-obvious over the cited references, but to expedite prosecution, these rejections are not belabored further herein.

Summary

The pending claims are directed to methods and apparatus that permit user authentication without requiring a user to duplicate passwords, passphrases, mouse sequences, or other predetermined submissions. In contrast, Brown and Odom merely apply biometrics to conventional password based systems. The novel and non-obvious claimed methods and apparatus permit arbitrary user input gestures to be used for authentication, and predetermined passwords, graphical sequences, and prompts to enter specific authentication information are not needed. The Odom reference explicitly acknowledges this key difference: "Computer login may comprise any user determined submission." See Odom, Abstract. In contrast, in the claimed apparatus and methods, there are no user determined submissions - the user merely begins to use the keyboard or the mouse.

Conclusion

For at least the above reasons, all pending claims are in condition for allowance and action to such end is respectfully requested. If any issues arise, or if a telephone conference is deemed helpful, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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